

**INDIANA DEPARTMENT OF TRANSPORTATION
OFFICE OF MATERIALS MANAGEMENT**

**SAMPLING HMA
ITM No. 580-10T**

1.0 SCOPE.

- 1.1** This method covers the procedures for sampling HMA from the pavement by a plate or core, or from a truck. The random quantity or location of the sample shall be determined in accordance with ITM 802. Samples obtained for moisture content determination shall be immediately placed in an oven bag and sealed.
- 1.2** The values stated in either acceptable English or SI metric units are to be regarded separately as standard, as appropriate for a specification with which this ITM is used. Within the text, SI metric units are shown in parenthesis. The values in each system may not be exact equivalents; therefore, each system shall be used independent of the other, without combining values in any way.
- 1.3** This procedure may involve hazardous materials, operations and equipment and may not address all of the safety problems associated with the use of the test method. The user of the ITM is responsible for establishing appropriate safety and health practices and determining the applicability of regulatory limitations prior to use.

2.0 REFERENCES.

2.1 ITM Standards.

- 802 Random Sampling
- 587 Reducing HMA Samples to Testing Size

3.0 TERMINOLOGY. Definitions for terms and abbreviations shall be in accordance with the Department's Standard Specifications, Section 101.

4.0 SIGNIFICANCE AND USE. This ITM is used to obtain HMA samples for testing purposes.

5.0 APPARATUS.

- 5.1** Sampling plate with a hole of approximately 3/8 in. (9.5 mm) diameter. The plate shall be square and have a minimum size of 8 in. (200 mm). The corners of the plates may be rounded (maximum radius of 1 in. (25 mm)) to accommodate placement of the mixture into a container.
- 5.2** No. 18 mechanics wire or equivalent

- 5.3** Masonry nail or equivalent
- 5.4** Round mold. The mold shall have a height greater than the mixture thickness. The diameter of the mold may vary; however, the mold diameter shall be less than the width of the plate. The mold will be approved by the Engineer.
- 5.5** Pitchfork
- 5.6** Square Bit Shovel, appropriate size to obtain the required sample
- 5.7** Sample container for truck sampled material or cardboard transport container lined with non-absorbent paper for plate sampled material. Both containers shall be of sufficient stiffness to support the sample and allow safe handling of the material
- 5.8** Oven bag
- 5.9** Coring device capable of obtaining a 6 in. (150 mm) core
- 6.0** **SAMPLING.** When samples from the pavement are used for acceptance of the HMA, the Department will determine the test site in accordance with ITM 802. The Contractor shall obtain the sample in the presence of the Engineer and shall supply all of the necessary equipment to obtain the sample.
- 7.0** **SAMPLE SIZE.**

7.1 Plate Samples.

7.1.1 The minimum size of sample for the plate sample shall be as follows.

Mixture Designation	Size of Sample		
	Minimum Weight (Mass) of Sample, g		
	Moisture	MSG and Binder Content	Gyratory Specimens
4.75 mm	1000	3000	11,000
9.5 mm	1500	3000	11,000
12.5 mm	2000	4000	11,000
19.0 mm, OG 19.0 mm	3000	5500	11,000
25.0 mm, OG 25.0 mm	4000	7000	11,000

The following table may be used to estimate the approximate yield of sample material from a plate sample for varying plate sizes and lift thicknesses for all mixtures except the 4.75 mm mixture:

Approximate Sample Yield for Various Lift Thicknesses and Plate Sizes									
Lift Thickness	Lay Rate		Plate Size, Inches						
Inches	lb/yd²	kg/m²	8	9	10	11	12	14	16
			Sample Weight (g)						
1.25	137.5	75	3100	3900	4800	5900	7000	9500	12400
1.5	165	90	3700	4700	5800	7000	8400	11400	14900
1.75	192.5	105	4300	5500	6800	8200	9800	13300	17300
2.0	220	120	5000	6300	7700	9400	11100	15200	19800
2.25	247.5	135	5600	7100	8700	10500	12500	17100	22300
2.5	275	150	6200	7800	9700	11700	13900	19000	24800
2.75	302.5	165	6800	8600	10600	12900	15300	20900	27300
3.0	330	180	7400	9400	11600	14100	16700	22800	29700
3.25	357.5	195	8100	10200	12600	15200	18100	24700	32200
3.5	385	210	8700	11000	13500	16400	19500	26600	34700
3.75	412.5	225	9300	11800	14500	17600	20900	28500	37200
4.0	440	240	9900	12500	15500	18700	22300	30300	39600
4.25	467.5	255	10500	13300	16400	19800	23600	32100	41900
4.5	495	270	11100	14000	17300	21000	25000	34000	44400
4.75	522.5	285	11700	14800	18300	22100	26400	35900	46900
5.0	550	300	12300	15600	19300	23300	27700	37800	49300
5.25	577.5	315	12900	16400	20200	24500	29100	39700	51800
5.5	605	330	13600	17200	21200	25600	30500	41500	54300
5.75	632.5	345	14200	17900	22200	26800	31900	43400	56700
6.0	660	360	14800	18700	23100	28000	33300	45300	59200

The following table may be used to estimate the approximate yield of sample material from a plate sample for varying mold sizes and lift thicknesses for all mixtures except the 4.75 mm mixture:

Approximate Sample Yield for Various Lift Thicknesses and Mold Sizes							
Lift Thickness	Lay Rate		Mold Size, Inches				
Inches	lb/yd²	kg/m²	8	10	12	14	16
			Sample Weight (g)				
1.25	137.5	75	2400	3800	5400	7400	9700
1.5	165	90	2900	4500	6500	8900	11600
1.75	192.5	105	3400	5300	7600	10400	13600
2.0	220	120	3900	6100	8700	11900	15500
2.25	247.5	135	4400	6800	9800	13300	17400
2.5	275	150	4800	7600	10900	14800	19400
2.75	302.5	165	5300	8300	12000	16300	21300
3.0	330	180	5800	9100	13100	17800	23200
3.25	357.5	195	6300	9800	14200	19300	25200
3.5	385	210	6800	10600	15300	20800	27100
3.75	412.5	225	7300	11300	16300	22200	29100
4.0	440	240	7700	12100	17400	23700	31000
4.25	467.5	255	8200	12900	18500	25200	32900
4.5	495	270	8700	13600	19600	26700	34900
4.75	522.5	285	9200	14400	20700	28200	36800
5.0	550	300	9700	15100	21800	29700	38700
5.25	577.5	315	10200	15900	22900	31100	40700
5.5	605	330	10700	16600	24000	32600	42600
5.75	632.5	345	11100	17400	25100	34100	44500
6.0	660	360	11600	18200	26100	35600	46500

The following table may be used to estimate the approximate yield of sample material from a plate sample for varying plate sizes and lift thicknesses for the 4.75 mm mixture:

Approximate Sample Yield for Various Lift Thicknesses and Plate Sizes								
Lift Thickness	Lay Rate		Plate Size, Inches					
Inches	lb/yd²	kg/m²	18	20	22	24	26	28
			Sample Weight (g) *					
0.5	55	30	6200	7700	9300	11000	13000	15000
0.625	69	37.5	7800	9600	11600	13900	16300	18900
0.75	82.5	45	9300	11500	13900	16600	19500	22600
0.875	96	52.5	10800	13400	16200	19300	22700	26300
1	110	60	12400	15400	18600	22100	26000	30100
1.125	124	67.5	14000	17300	21000	24000	29000	34000

*Sample weights were obtained by including a plate thickness of 1/8 in.

7.1.2 Two plate sample boxes representing the 4.75 mm mixture shall be combined in the laboratory and reduced to testing size in accordance with ITM 587. The sample shall be reduced in accordance with ITM 587 section 7.0 for the gyratory specimens. The remaining sample shall be reduced in accordance with ITM 587 section 5.0 for the moisture, MSG, and binder content samples.

7.2 Truck Samples. The size of sample for the truck sample shall meet the minimum sample size requirement for the appropriate test method.

7.3 Cores. The number of cores taken from the pavement shall result in sufficient weight (mass) to meet the minimum weight (mass) requirement for the appropriate test method. A 6 in. (150 mm) diameter core has a weight (mass) of approximately 1100 g/in. (44 g/mm)

8.0 PROCEDURE.

8.1 Plate Samples without a Mold

8.1.1 Place the plate with wire attached at the designated location. If conditions on the project cause the plate to slip, drive a nail into the pavement and place the plate hole onto the nail.

8.1.2 Extend the wire tightly beyond the edge of the paving width. The wire shall not pass under a grade leveler attached to the paver. Trucks, pavers, and/or Material Transfer Devices shall be allowed to cross the plate and wire. If a windrow elevator is used, the paving operation shall be stopped

so that the plate may be placed at the designated location between the windrow elevator and the paver.

- 8.1.3** After the mixture is placed, locate the plate by use of the wire
- 8.1.4** Raise the plate slightly for insertion of a pitchfork or a shovel that is narrower than the plate
- 8.1.5** Lift the plate and sample, and place the entire sample into the sample container. Material remaining on the plate shall be removed and placed into the sample container.
- 8.1.6** Immediately refill the sample hole with HMA

8.2 Plate Samples with a Mold

- 8.2.1** Place the plate with wire in accordance with 8.1.1 to 8.1.3.
- 8.2.2** Push a clean mold, by means of a circular motion, down into the mixture directly over the plate. The mold shall not be pushed from side to side.
- 8.2.3** Raise the mold and plate together, and insert a pitchfork, or a shovel that is narrower than the plate
- 8.2.4** Lift the mold and plate, being careful to keep the two components tightly together
- 8.2.5** Discard any excess material on top of the plate that is outside of the mold by scraping the material from the plate
- 8.2.6** Place the sample inside of the mold into the sample container. Material remaining on the plate shall be removed and placed into the sample container.
- 8.2.7** Immediately refill the sample hole with HMA

8.3 Cores.

- 8.3.1** Using a coring device, cut a uniform 6 in (150 mm) diameter pavement sample
- 8.3.2** Remove the core from the pavement with a device that shall not damage the layer to be tested
- 8.3.3** Mark the mixture layer that is to be tested with a lumber crayon or permanent marker

- 8.3.4** The core hole shall be cleaned, dried and refilled with HMA of similar or smaller size particles within one work day of the coring operations.

8.4 Truck Samples, HMA 4.75 mm Mixtures.

- 8.4.1** Visually observe the mixture in the truck for determination of uniformity

- 8.4.2** Insert a shovel into various areas that appear uniform in texture, and place the mixture into the sample container.

8.5 Truck Samples, Open Graded HMA Mixture. Insert a shovel into the mixture between the center of the cone and the front of the truck to obtain one sample. Obtain another sample with the shovel from the mixture between the center of the truck and the back of the truck.

8.6 Truck Samples, Dense Graded HMA Mixture.

- 8.6.1** Insert a shovel horizontally into the mixture at the approximate mid section of the truck

- 8.6.2** Lift the shovel vertically to establish a horizontal plane in the mixture

- 8.6.3** Insert the shovel vertically to establish a vertical face below the horizontal plane

- 8.6.4** Insert the shovel horizontally into the vertical face at a depth of approximately twice the thickness of the maximum particle size of the material

- 8.6.5** Lift the shovel vertically to obtain the sample, and place the sample into the sample container

9.0 DOCUMENTATION. After the sample has been obtained, the sample location will be recorded. If the sample is obtained by the Contractor for the Department's acceptance testing, the Contractor representative who obtained the sample and the Department representative who witnessed the sample being taken will be identified on the transmittal information.